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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/646,134	08/22/2003	Tapantosh Chakrabarty	2001.057	8890

7590 04/27/2006

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EXAMINER

SINGH, PREM C

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 04/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/646,134

Applicant(s)

CHAKRABARTY ET AL.

Examiner

Prem C. Singh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 March 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Amendment to specifications are accepted.

Objections to claims 13-16 are withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation

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under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11, 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sankey et al (Bitumen Utilization via Partial Upgrading and Emulsification, Proceedings of Fueling for a Clean and Safe Environment, Unitar International Conference on Heavy Crude and Tar Sands, February 12-17, 1995, Houston, Texas, Page 269-276) in view of Tipman et al (US Patent 5,876,592).

Sankey invention discloses that in the PPU (Phased Partial Upgrading) concept, bitumen is separated into a lighter overhead fraction and a heavier bottom fraction (page 269, paragraph 4). The heavier residual fraction from the vacuum distillation unit is converted into a 70:30 oil-in-water emulsion for use as a fuel (page 269, paragraph 7).

Sankey invention also discloses that based on the feedstock received, we designed a pilot hydrotreating program. This involved hydrotreating a wide-cut (93-510°C) fraction of the PPU overhead stream to improve the overall quality of the crude (Page 270, last paragraph and page 271, paragraph 1).

Sankey invention discloses the separation of bitumen into light and heavy fractions using an atmospheric and vacuum distillation units.

Tipman invention teaches bitumen separation by a gas plant diluent.

Tipman invention discloses a method for cleaning bitumen froth containing water and particulate solids contaminants, said froth having been produced by a water extraction process practised on oil sands, comprising: adding paraffinic solvent to the froth in sufficient amount to produce a solvent to froth ratio ("S/F") of at least 0.6 (w/w); and subjecting the mixture to gravity or centrifugal separation for sufficient time to reduce its water plus solids component to less than about 0.5 wt %. Most preferably the solvent used is natural gas condensate, a mixture of low molecular weight alkanes with chain lengths from about C₅ to C₁₆, added in sufficient amount to produce a solvent to froth ratio of about 1.0 (w/w) (Column 3, lines 21-32). Tipman adds in TABLE 9 (Columns 9 and 10) using heptane to bitumen ratio from 0.68 to 5.00 (w/w).

Tipman invention further discloses the compositions of the solvents used in the tests in TABLE 10 as naphtha consisting of 43% paraffins, 40% naphthenes, and 17% aromatics and natural gas condensate consisting of 83% paraffins, 12% naphthenes, and 5% aromatics (Column 11, lines 25-30).

It would have been obvious to one skilled in the art at the time the invention was made to combine the teachings of Sankey and Tipman inventions and separate the bitumen using a solvent (with known compositions) from a natural gas plant due to its easy availability and cheaper operating cost.

Tipman invention teaches (as mentioned under claims 4 and 5) about adding paraffinic solvent to the froth and subjecting the mixture to gravity or centrifugal separation for sufficient time (Column 3, lines 24-27). Tipman invention also adds in Example X (and Figure 5) a run conducted in a scaled up pilot circuit using natural gas condensate as the diluent. The S/F ratio was maintained at about 1.20 (w/w) (Column 12, lines 35-39). The run continued for a period of 7.25 hours with approximately one-half of the operating time at 50°C and the other half at 117°C (ave) (Column 12, lines 60-63). The centrifuge contents separated into 4 layers, specifically: a clean oil layer, a viscous rag layer, a water layer, and a solids layer (Column 13, line 45; column 14, lines 17-18).

Although Tipman invention does not specifically mention the flashing of the remaining diluent, it would have been obvious to one skilled in the art at the time the invention was made to combine Sankey and Tipman inventions and flash the remaining solvent to purify it and recycle in the process.

Sankey invention discloses the static mixer emulsification unit in figure 2. Separate feed vessels are provided for resid, aqueous surfactant solution, and quench water. The resid is heated to reduce its viscosity to a level which facilitates pumping. Hot resid and the surfactant solution are pumped together through a first series of static mixers under sufficient pressure to maintain water in the liquid phase. Since temperature of the resulting stream is typically above 100°C, cold water is added in a quench step to cool and dilute the emulsion in a second set of static mixers (Page 272,

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column 1, paragraph 2). However, the PPU emulsion has a median droplet size of only 5 μm , which is smaller than the particles in a typical whole bitumen emulsion (Page 273, column 1, last paragraph). The optimum water content is, therefore, set at the minimum level which allows viscosity specification for transportation or handling to be met. At 30% water, the PPU emulsion has a viscosity of 250 cp at 20°C which is in the range typically specified by long distance pipeline operators (Page 273, column 1, paragraph 2).

Although Sankey invention discloses water content in the emulsion, it does not specifically mention the amount of water added in the surfactant formation and the quench steps separately.

It would have been obvious to one skilled in the art at the time the invention was made to modify Sankey invention and add equal amounts of water in the two steps to simplify the process and make it easier for data recording.

Claims 12 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sankey in view of Tipman and further in view of Wu et al (US Patent 4,119,149).

Sankey invention discloses that several tests were carried out to determine various aspects of PPU emulsion combustion including combustion characteristics, corrosion, and flue gas compositions (Page 273, column 2, paragraph 3). Sankey invention also discloses the economics of using bitumen emulsion for a boiler retrofit on page 276. A study was undertaken to establish the cost for retrofitting an existing 500

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MW unit fired with fuel oil or coal, to accept PPU emulsion fuel (Page 276, column 1, paragraph 1).

Sankey invention does not specifically mention about using the steam from the boiler for bitumen recovery from an underground reservoir.

Tipman invention discloses (as mentioned under claim 1) separation of bitumen by a gas plant diluent process. Sankey discloses (as mentioned under claim 1), emulsification of the heavy fraction with water to form a combustible mixture, and combustion of the emulsion in a boiler unit to produce steam.

Sankey and Tipman inventions do not mention about using the steam for bitumen recovery from an underground reservoir.

Wu discloses that it is known, generally to produce petroleum oils, tar sand bitumens, and related petroleum hydrocarbons from shale, sandstone, unconsolidated sand, and other subterranean formations by injecting steam into a first well for heating the petroleum in such formations and forcing such petroleum to a second well from which such petroleum is produced (Column 1, lines 16-22). Wu invention further adds:

- (d) flashing, in a flash zone, said mixture of petroleum and steam condensate for production of a liquid phase comprising petroleum and a vapor phase comprising steam and hydrocarbon vapor;
- (e) condensing, in a condenser, said vapor phase for producing a condensate comprising water and liquid hydrocarbons;
- (f) separating, in a gravity separation zone, said condensate into a water phase and a hydrocarbon phase (Column 1, lines 65-68; column 2, lines 1-6).

Wu invention does not specifically mention about treating the water to remove contaminants.

It would have been obvious to one skilled in the art at the time the invention was made to combine Sankey, Tipman, and Wu inventions by taking steam generated in the Sankey invention and using it for bitumen recovery as disclosed by Wu invention. Further, it would have been obvious to treat the water for reuse and save substantially by reducing fresh make up water.

Response to Arguments

The applicant's argument states that Sankey invention does not disclose a flash separation (without distillation columns).

Applicant's claim 1 (a) "...consisting of a two-stage flash separation process" does not exclude atmospheric and vacuum distillation units disclosed in Sankey invention.

Applicant's argument mentions the use of highly viscous and aliphatic crudes such as recovery of Cold Lake and Athabasca bitumen.

Sankey invention discloses that although the feed for the PPU process can be either bitumen or diluted bitumen, the latter is preferred for Cold Lake application (Page 269, column 2, paragraph 4).

Applicant's argument mentions that Tipman adds nothing to Sankey in leading one to use a bitumen feed without a water-based process for the primary separation.

Sankey invention discloses using either bitumen or diluted bitumen (Page 269, column 2, paragraph 4).

The applicant's argument states the benefit by using the readily available diluent.

Tipman uses similar diluents with similar compositions.

The applicant's argument regarding Wu invention states that a bitumen process using steam alone for further recovery of bitumen is not taught or suggested.

Wu invention discloses that it is known, generally to produce petroleum oils, tar sand bitumens, and related petroleum hydrocarbons from shale, sandstone, unconsolidated sand, and other subterranean formations by injecting steam into first well for heating the petroleum in such formations and forcing such petroleum to a second well from which such petroleum is produced (Column 1, lines 16-22).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prem C. Singh whose telephone number is 571-272-6381. The examiner can normally be reached on MF 6:30 AM-3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on 571-272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ps/042406


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